Small Spacecraft Technology

Precision Global Navigation Satellite System Relative Navigation & Timekeeping for Miniaturized Distributed Space Systems

Completed Technology Project (2016 - 2018)

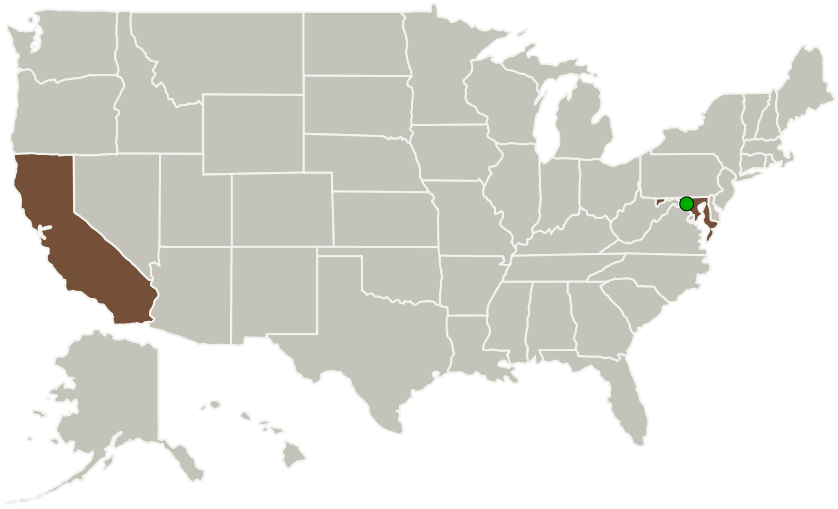
Project Introduction

The goal of this project is to provide unprecedented precision real-time absolute and relative navigation capabilities to formations of nanosatellites using signals offered by modern Global Navigation Satellite Systems. The 0.5U system and associated software is capable of integration with most satellites to provide peer-to-peer decentralized navigation accuracy at the centimeter-level over separations up to hundreds of kilometers. The ability for each small spacecraft to know the relative positions of the other spacecraft in the formation with high precisions is desirable in several mission types including remote sensing, communication, and proximity operations.

Anticipated Benefits

This technology can be used to enhance proximity operations within Earth orbit and could help constellations of nanosatellites to precisely correlate distributed scientific observations and to coordinate spacecraft flying in formation to produce a distributed aperture.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Stanford University(Stanford)	Lead Organization	Academia	Stanford, California
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
Tyvak Nano-Satellite Systems Inc.	Supporting Organization	Industry	Irvine, California

Primary U.S. Work Locations	
California	Maryland

Project Website:

https://www.nasa.gov/directorates/spacetech/small_spacecraft/index.html#.V(

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Stanford University (Stanford)

Responsible Program:

Small Spacecraft Technology

Project Management

Program Director:

Christopher E Baker

Program Manager:

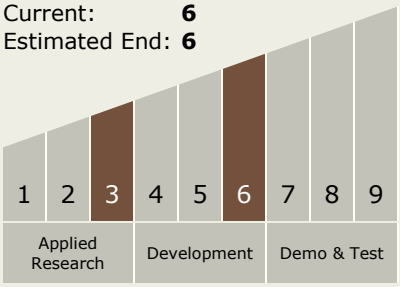
Roger Hunter

Principal Investigator:

Simone D'amico

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



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Target Destination

Earth